

Central Valley Regional Water Quality Control Board

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CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD

DATE: 30 July 2012

SUBJECT: DRAFT REQUIREMENTS FOR PANOCHE ENERGY CENTER LLC, PANOCHE
ENERGY CENTER, FRESNO COUNTY

The following contains recommended information and requirements for the California Energy Commission (CEC) to include in its permit for the proposed Panoche Energy Center discharge to unlined ponds. They are arranged under the section headings of Findings, Prohibitions, Discharge Specifications, Effluent Limitations, Groundwater Limitations, Provisions, and Monitoring. These headings are arranged in an order similar to that contained in waste discharge requirements typically adopted by the Central Valley Water Board. We look forward to discussing any changes California Energy Commission staff deems appropriate and providing additional rationale for specific requirements, if necessary. To preserve its ability to pursue enforcement should the discharge cause nuisance or pollution problems, the Central Valley Water Board may adopt waste discharge requirements for the discharge following the CEC's permitting action. We understand that the waste discharge requirements will need to mirror the permit approved by the CEC. Please contact Lonnie M. Wass of our Fresno Office at (559) 445-6051 or Dale Harvey at (559) 445-6051 to discuss these requirements.

FINDINGS

1. On 21 September 2009, URS Corporation, on behalf of Panoche Energy Center, LLC, (Panoche) a Delaware limited liability company, submitted a Report of Waste Discharge (RWD) for the discharge of wastewater to two unlined evaporation/percolation ponds at the Panoche Energy Center power plant (Panoche Energy Center). Additional information was received on 18 November 2009, 25 January 2010, 26 August 2010, 30 November 2010, and 1 December 2010.
2. Panoche has a Class 1, non-hazardous injection well permit (No. CA 10600001) under the Underground Injection Control Program of the United States Environmental Protection

Agency (USEPA) for the injection of its entire waste stream. Unfortunately, the injection wells have lacked capacity to handle the entire waste stream. Therefore, Panoche filed a report of waste discharge to construct surface impoundments as an alternative disposal method.

3. Panoche has continued to explore modifications to the injections wells to determine if deep well disposal can adequately dispose of its entire waste stream. The results of those modifications are not yet determinative. If successful, Panoche may not construct or utilize the surface impoundments. The description that follows reflects the treatment and disposal system for the surface impoundment alternative.
4. Panoche, has a lease with the property owner, Firebaugh RE Holdings, LLC, a Delaware limited liability company. Both Panoche and Firebaugh RE Holdings, LLC are hereafter jointly referred to as Discharger.
5. The Panoche Energy Center is at 43883 West Panoche Road, an unincorporated area of western Fresno County. It is about 13 miles southwest of the City of Mendota and two miles east of Interstate 5.
6. The 12.82-acre Panoche Energy Center is on a 22.0-acre parcel (Assessor's Parcel Number 027-060-87S) in the southwest quarter of Section 5, Township 15 South, Range 13 East, Mount Diablo Base and Meridian. The unlined surface impoundments will be located on an additional 9.18 acres of land on the same parcel, immediately south of the 12.82 acres.
7. The energy plant is a new 400 megawatt power plant with four natural gas-fired combusting turbine generators. The energy plant is expected to operate 5,000 hours per year.
8. Source water is stored in a 500,000 gallon tank before a portion of the water is treated by ultrafiltration and a two-stage reverse osmosis (RO) system and another portion is directly used by the combustion turbine generators (turbines). A portion of the RO water is used for domestic supply at the energy plant and another portion of the demineralized water is blended with source water for use in the turbines. Approximately 69 percent of the water used by the turbines is composed of demineralized water. Backwash water from the ultrafiltration unit passes through an oil-water separator before being discharged to a 20,000 gallon holding tank. Reject from the second-stage RO unit is recycled as influent to the first-stage RO unit to conserve water. Final reject from both RO units is discharged to the 20,000 gallon holding tank.
9. Both evaporative cooler blowdown and intercooler condensation from the turbines are circulated through the cooling towers. Cooling tower blowdown is then discharged to the 20,000 gallon holding tank.
10. Wastewater from the RO reject, effluent from the oil-water separator, and cooling tower blowdown comingles in the holding tank before a portion of the wastewater passes through the arsenic and boron removal systems.

11. The arsenic removal system consists of three six-foot diameter pressure vessels, containing 135 cubic feet of granular ferric hydroxide (GFH) filtration/adsorption media, where arsenic will be adsorbed to the GFH media.
12. The boron removal system follows the arsenic removal system and consists of two treatment trains. Each treatment train will have two pressure vessels, each containing 270 cubic feet of boron-selective resin (BSR) media. One treatment train will be in service at a time with the pressure vessels operating in a lead/lag configuration. Approximately 70 percent of the wastewater will pass through the boron removal system and the remainder wastewater will bypass the boron removal system and be blended with treated wastewater.
13. The Discharger proposes to reduce the Sodium Adsorption Ratio (SAR) of the wastewater by adjusting the calcium concentration. Approximately 158 mg/L of calcium chloride will be added to the wastewater.
14. Wastewater discharged into unlined evaporation/percolation ponds will be treated by the arsenic and boron treatment system to the extent necessary to comply with effluent limitations 4 and 5. Wastewater not discharged to evaporation/percolation ponds will be disposed of in the injection wells regulated by Permit No. CA 10600001 issued by the United States Environmental Protection Agency under the Underground Injection Control Program.
15. Wastewater produced at the energy plant consists of approximately 74 percent cooling-tower blowdown, 25 percent reverse osmosis system reject, and 1 percent effluent from an oil-water separator. Panoche estimates that a maximum of approximately 390 acre-feet (AF) of wastewater could be produced a year (calculated to be approximately 0.35 million gallons per day). Table 1 shows the quality of the different wastewater streams in Panoche's process and the final untreated effluent.

Table 1. Waste Streams and Effluent

Constituents	Units	Cooling-Tower Blowdown	RO Reject	Oil Water Separator	Effluent ¹
As	mg/L	0.093	0.11	0.031	0.094
B	mg/L	10.5	12.43	3.5	10.57
Se	mg/L	0.011	0.013	0.004	0.011
Cl	mg/L	300	355	100	302
Na	mg/L	1,317	1,558	439	1,325
SO ₄	mg/L	2,368	2,290	645	2,383
TDS	mg/L	4,220	4,467	1,258	4,247
EC ²	umhos/cm	6,564	6,949	2,100	6,606

¹ Comingled wastewater prior to being discharged to the proposed unlined evaporation/percolation ponds

16. Effluent concentrations of arsenic, boron, and sodium are elevated and exceed that of groundwater. Panoche proposes to treat arsenic and boron to concentrations of 0.042

mg/L and 3.2 mg/L, respectively. For sodium, Panoche proposes to reduce the effluent SAR to 40.

17. Source water for the energy plant is from two on-site wells that are screened in the confined aquifer below the Corcoran Clay. Source water data provided in the RWD is shown in Table 2:

Table 2. Source Water Quality

<u>Constituent</u>	<u>Units</u>	<u>Source Water (Confined)</u>
As	mg/L	0.031
B	mg/L	3.5
NO ₃ -N	mg/L	ND
Se	mg/L	0.0038
Cl	mg/L	100
Na	mg/L	439
SO ₄	mg/L	645
TDS	mg/L	1,350
EC ³	umhos/cm	2,100

18. Land uses in the vicinity of the Panoche Energy Center are primarily agricultural and some rural residential. The primary crops grown in the area are almonds, cotton, tomatoes, and some grapes, according to the Fresno County 2000 Land Use Map published by the Department of Water Resources (DWR). There is a Pacific Gas and Electric (PG&E) electrical substation immediately east of Panoche Energy Center. The CalPeak Panoche, Starwood-Midway Power Plant, and Wellhead Peaker Plant are just east of Panoche Energy Center.
19. The Panoche Energy Center is in an area with semi-arid climate characterized by dry summers and mild winters. The rainy season generally extends from October through April. Five Points 5 South-southwest is the nearest weather station. According to the National Weather Service, the average annual precipitation is about 7.40 inches, based on 30 years of data. The annual average pan evaporation at the Little Panoche Detention Dam to the west is about 111 inches, according to the Western Regional Climate Center.
20. Soils in the vicinity of Panoche Energy Center are predominately Cerini Clay Loam, followed by Panoche Clay Loam, according to the Web Soil Survey published by the United States Department of Agriculture, Natural Resources Conservation Service (NRCS). Cerini Clay Loam and Panoche Clay Loam have been assigned a land capacity classification of 2e and 1, respectively. Cerini Clay Loam has moderate limitations that restrict the choice of plants or require moderate conservation practices. Additionally, the main problem is the hazard of erosion damage. Panoche Clay Loam has slight limitations that restrict its use. Internal drainage in these soils is described as well drained according to NRCS.

21. According to the Federal Emergency Management Agency maps (Map Number 06019C1975H), the Panoche Energy Center is within Zone A, an area with a one percent annual chance of flooding.
22. The Discharger is not required to obtain coverage under a National Pollutant Discharge Elimination System General Industrial Storm Water Permit for the discharge because all storm water runoff is retained onsite and does not discharge to a water of the United States.
23. First encountered groundwater in the area exists approximately 170 feet below ground surface (bgs) in a semi-confined aquifer above the Corcoran Clay. Confined groundwater exists below the Corcoran Clay, which is at a depth of about 650 to 760 feet.
24. According to the *Assessment Report*, dated 30 November 2010, groundwater flows to the east at a gradient ranging from 0.001 to 0.005.
25. Local groundwater monitoring well samples indicate first encountered groundwater has an EC level of 6,150 to 10,600 $\mu\text{mhos/cm}$; a TDS concentration of 4,000 to 6,800 mg/L ; an arsenic concentration of 0.008 to 0.063 mg/L ; a boron concentration of 3.0 to 3.3 mg/L ; and a sodium concentration of 500 to 840 mg/L .
26. The *Assessment Report*, dated 30 November 2010, evaluates data from three monitoring wells (MW-1 through MW-3) for the Starwood Power-Midway (Starwood) Peaking Plant about 1,000 feet northeast from Panoche Energy Center. As Starwood had not discharged to its unlined evaporation/percolation ponds prior to sampling, data from these monitoring wells is representative of ambient groundwater conditions in the area. The data show that ambient groundwater in the vicinity of the Panoche Energy Center is poor quality with respect to general minerals. Arsenic and nitrate concentrations exceed the primary maximum contaminant levels (MCLs) and boron concentrations exceed levels suitable for most crops. Groundwater sodium concentrations would require special management if applied directly to most crops.
27. A report titled, *Additional Information Report*, dated 25 January 2010 indicates first encountered groundwater has historically been poor. When irrigation with groundwater in the Panoche area started between 1940 and as late as 1950, recharge increased by about 40 times and leached soluble selenium and salts from the soil into shallow groundwater. In 1910, a well near the present location of Panoche Energy Center contained total dissolved solids and chloride concentrations of approximately 3,100 mg/L and 160 mg/L , respectively. The groundwater appears to have been naturally poor when the irrigation started.
28. Due to its poor quality, first encountered groundwater underlying the Panoche Energy Center is generally not used. Agricultural uses are limited to small quantities that are entrained with better quality deeper water in older wells with some screen above the Corcoran Clay. Because of its salinity, first encountered groundwater could only be used in isolated cases to irrigate the most salt tolerant crops.
29. Panoche Energy Center has one monitoring well screened between 150 and 210 feet bgs. A minimum of three monitoring wells are needed to determine flow direction and monitor

the quality of underlying groundwater in the vicinity of the discharge. The Discharger needs to expand its groundwater monitoring well network to monitor the discharge to first encountered groundwater.

30. The *Water Quality Control Plan for the Tulare Lake Basin, Second Edition, revised January 2004* (Basin Plan) designates beneficial uses, establishes narrative and numerical water quality objectives, contains implementation plans and policies for protecting all waters of the Basin, and incorporates, by reference, plans and policies of the State Water Board. In accordance with Water Code section 13263(a), these requirements implement the Basin Plan.
31. Panoche Energy Center is in Detailed Analysis Unit (DAU) No. 244, within the Westside Basin hydrologic unit. The Basin Plan identifies the beneficial uses of groundwater in the DAU as municipal and domestic supply, agricultural supply, and industrial service supply.
32. Panoche Energy Center is in the Westlands Hydrologic Area No. 551.10 of the South Valley Floor Hydrologic Unit, as depicted on interagency hydrologic maps prepared by the DWR in August 1986. The Basin Plan identifies the beneficial uses of surface water in this area as agricultural, industrial service and industrial process supply; water contact and non-contact water recreation; warm freshwater and wildlife habitat; rare, threatened, or endangered species; and groundwater recharge.
33. The Basin Plan includes a water quality objective for chemical constituents that, at a minimum, require waters designated as domestic or municipal supply to meet the MCLs specified in Title 22 of California Code of Regulations (CCR). The Basin Plan recognizes that the Central Valley Water Board may apply limits more stringent than MCLs to ensure that waters do not contain chemical constituents in concentrations that adversely affect beneficial uses.
34. The Basin Plan establishes narrative water quality objectives for Chemical Constituents, Taste and Odors, and Toxicity. The Toxicity objective, in summary, requires that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life associated with designated beneficial uses. Quantifying a narrative water quality objective requires a site-specific evaluation of those constituents that have the potential to impact water quality and beneficial uses.
35. The Basin Plan identifies the greatest long-term problem facing the entire Tulare Lake Basin as the increase in salinity in groundwater, which has accelerated due to the intensive use of soil and water resources by irrigated agriculture. The Basin Plan recognizes that degradation is unavoidable until there is a long-term solution to the salt imbalance. Until then, the Basin Plan establishes several salt management requirements, including the following limits:
 - a. The incremental increase in salts from use and treatment must be controlled to the extent possible. The maximum EC of the effluent discharged to land shall not exceed the EC of the source water plus 500 $\mu\text{mhos/cm}$. When the source water is from more than one source, the EC shall be a weighted average of all sources.

- b. Discharges to areas that may recharge good quality groundwater shall not exceed an EC of 1,000 $\mu\text{mhos/cm}$, a chloride content of 175 mg/L, or boron content of 1.0 mg/L.
36. The Basin Plan objectives do not require improvement over naturally occurring background concentrations.
37. The Basin Plan authorizes an exception for industrial wastewater from the incremental increase of 500 $\mu\text{mhos/cm}$ plus source water provided the Discharger can technically demonstrate that allowing a greater net incremental increase in EC will result in lower mass emissions of salts to water. The Discharger's net incremental increase is due in part to water conservation measures, and in part due to treatment necessary to make the source water suitable for its use as industrial and domestic supply. The RWD indicates that cooling tower water is cycled three times, evaporative cooler water is cycled 6.5 times, and RO stage two reject is recycled into the influent for RO stage one. While these conservation practices result in an increase in wastewater EC, the net result will be lower mass emissions of salts to first encountered groundwater that will not adversely affect the beneficial uses of that groundwater. Therefore, the discharge as proposed complies with the exception authorized by the Basin Plan.
38. As described in Findings 23 through 28 above, the discharge is not to an area that overlies good quality groundwater with respect to EC, chloride, and boron. Therefore, the Basin Plan limits in Finding 35.b above do not apply to the discharge.
39. State Water Board Resolution No. 68-16 ("Policy with Respect to Maintaining High Quality Water of the State") (hereafter Resolution No. 68-16) prohibits degradation of groundwater unless it has been shown that:
- a. The degradation does not result in water quality less than that prescribed in state and regional policies, including violation of one or more water quality objectives;
 - b. The degradation will not unreasonably affect present and anticipated future beneficial uses;
 - c. The Discharger employs Best Practicable Treatment or Control (BPTC) to minimize degradation; and
 - d. The degradation is consistent with the maximum benefit to the people of the State.
40. Constituents of concern in the discharge that have the potential to degrade groundwater include arsenic, boron, and sodium. The terms and conditions of discharge herein will assure that the discharge does not unreasonably affect present and anticipated uses of groundwater. Groundwater limitations apply water quality objectives established in the Basin Plan to protect beneficial uses. The discharge will not impair the beneficial uses of groundwater because:

- a. The Discharger proposes to remove arsenic in its discharge to background levels. The median groundwater arsenic concentration as a median of all wells sampled has ranged from 26 ug/L to 52 ug/L between First Quarter 2008 and Fourth Quarter 2010. The Discharger will treat its effluent to remove arsenic to 42 ug/L. Additional arsenic removal will occur as the effluent percolates the 170 feet to first encountered groundwater. It is not expected that the discharge will cause groundwater to exceed ambient arsenic concentrations.
 - b. The Discharger proposes to remove boron to 3.2 mg/L commensurate with baseline groundwater boron concentrations. Discharges are not expected to cause groundwater boron concentrations to exceed ambient concentrations.
 - c. There is no specific water quality objective for sodium specific to the crops that can be grown with first encountered groundwater. Panoche acknowledges that the discharge will cause the sodium concentration of groundwater to exceed that of natural background. However, the Discharger proposes to regulate the SAR of the discharge by adding calcium chloride so that it is protective of the potential (albeit limited) agricultural beneficial uses of first encountered groundwater. Any sodium degradation that does occur will not unreasonably affect any present and anticipated future beneficial uses of first encountered groundwater. The overall EC and TDS of the discharge will be less than that of first encountered groundwater.
 - d. The Discharger will be using granular ferric hydroxide filtration/adsorption media and boron selective resin media treatment processes to remove arsenic and boron from its discharge. The Discharger will be adjusting the SAR of its effluent to moderate the potential effects of sodium on groundwater. The requirements herein require the Discharger to maximize the use of its injection wells to the extent feasible and develop and implement a salinity management plan. The requirements herein require extensive effluent and groundwater monitoring to ensure compliance with Basin Plan requirements. These practices are considered BPTC for this discharge.
 - e. The authorized degradation with respect to sodium is to the maximum benefit to the people of the State, because it will not unreasonably impact the beneficial uses of underlying groundwater and will provide:
 - i. A more reliable electrical supply for the State, and
 - ii. Increased employment in the area.
41. Pursuant to Water Code section 13263(g), discharge is a privilege, not a right, and the issuance of discharge permit does not create a vested right to continue the discharge.

PROPOSED PROHIBITIONS

1. Discharge of waste to surface waters or surface water drainage courses is prohibited.

2. Discharge of waste classified as 'hazardous', as defined in section 2521(a) of Title 23, CCR, section 2510 et seq., is prohibited. Discharge of waste classified as 'designated', as defined in Water Code section 13173, is prohibited.
3. Discharge of wastewater in a manner or location other than that described herein is prohibited.
4. Discharge of industrial wastewater to septic systems is prohibited.

Discharge Specifications

1. No waste constituent shall be released, discharged, or placed where it will be released or discharged, in a concentration or in a mass that causes violation of Groundwater Limitations described below.
2. Wastewater treatment, storage, and disposal shall not cause pollution or a nuisance as defined by section 13050 of the Water Code.

Effluent Limitations

1. The effluent shall not have a pH less than 6.5 or greater than 9.0.
2. The monthly average effluent total dissolved solids concentration shall not exceed 4,500 mg/L.
3. The monthly average effluent electrical conductivity shall not exceed 7,000 umhos/cm.
4. The daily maximum effluent arsenic concentration shall not exceed 42 ug/L.
5. The daily maximum effluent boron concentration shall not exceed 3.2 mg/L.

Groundwater Limitations

1. Release of waste constituents from any treatment or storage component associated with the discharge shall not cause or contribute to groundwater:
 - a. Containing constituent concentrations in excess of the concentrations specified below or natural background quality whichever is greater:
 - (i) For constituents identified in Title 22, the MCLs quantified therein.
 - b. Containing toxic substances, or any other constituents in concentrations that cause nuisance or adversely affect beneficial uses.
 - c. With the exception of sodium, the discharge of wastewater to the unlined evaporation/percolation ponds shall not cause groundwater to exceed background water quality.

- d. With respect to sodium, the discharge shall not cause the concentration of sodium in groundwater or the Sodium Adsorption Ratio in groundwater to increase to a level exceeding 40.

Provisions

1. The Discharger shall provide written notice to the Regional Board Executive Officer and the California Energy Commission Compliance Project Manager at least 90 days prior to start of construction of the treatment system and surface impoundments. With the exceptions of the time schedules in Provisions 24, 25, and 26, compliance with this order, provisions, and monitoring and reporting requirements shall not commence until completion of construction and commencement of the discharge. Compliance with the dates in Provisions 24, 25, and 26 shall commence as described therein.
2. The Discharger shall operate all systems and equipment to optimize the quality of the discharge.
3. The requirements prescribed herein do not authorize the commission of any act causing injury to the property of another, or protect the Discharger from liabilities under federal, state, or local laws. These requirements do not convey any property rights or exclusive privileges.
4. Before making a material change in the character, location, or volume of discharge, the Discharger shall file a new Report of Waste Discharge with the California Energy Commission and Central Valley Water Board.
5. Except for material determined to be confidential in accordance with California law and regulations, all reports prepared in accordance with terms of these requirements shall be available for public inspection at the offices of the California Energy Commission and Central Valley Water Board. Data on waste discharges, water quality, geology, and hydrogeology shall not be considered confidential.
6. The Discharger shall take all reasonable steps to minimize any adverse impact to the waters of the state resulting from noncompliance with these requirements. Such steps shall include accelerated or additional monitoring as necessary to determine the nature and impact of the noncompliance.
7. The Discharger shall permit representatives of the Central Valley Water Board, the State Water Resources Control Board, and the California Energy Commission, upon presentations of credentials, to:
 - a. Enter premises where wastes are treated, stored, or disposed of and facilities in which any records are kept,
 - b. Copy any records required to be kept under terms and conditions of these requirements,
 - c. Inspect at reasonable hours, monitoring equipment required by these requirements, and

- d. Sample, photograph and video tape any discharge, waste, waste management unit, or monitoring device.
8. For any electrically operated equipment at the site, the failure of which would cause loss of control or containment of waste materials, or violation of these requirements, the Discharger shall employ safeguards to prevent loss of control over wastes. Such safeguards may include alternate power sources, standby generators, retention capacity, operating procedures, or other means.
9. The fact that it would have been necessary to halt or reduce the permitted activity in these requirements to maintain compliance with these requirements shall not be a defense for the Discharger's violations of these requirements.
10. The disposal ponds or structures shall have sufficient capacity to accommodate allowable wastewater flow, design seasonal precipitation, and ancillary inflow and infiltration during the winter while ensuring continuous compliance with all requirements herein. Design seasonal precipitation shall be based on total annual precipitation using a return period of 100 years, distributed monthly in accordance with historical rainfall patterns.
11. On or about **1 October** of each year, available capacity shall at least equal the volume necessary to comply with Provision 10.
12. Ponds shall be managed to prevent breeding of mosquitoes. In particular:
 - a. An erosion control plan should assure that coves and irregularities are not created around the perimeter of the water surface.
 - b. Weeds shall be minimized through control of water depth, harvesting, and herbicides.
 - c. Dead algae, vegetation and other debris shall not accumulate on the water surface.
 - d. Vegetation management operations in areas in which nesting birds have been observed shall be carried out either before or after, but not during, the 1 April to 30 June bird nesting season.
13. The Discharger shall maintain and operate the ponds sufficiently to protect the integrity of containment levees and prevent overtopping or overflows. Unless a California registered civil engineer certifies (based on design, construction, and conditions of operation and maintenance) that less freeboard is adequate, the operating freeboard shall never be less than two feet (measured vertically). As a means of management and to discern compliance with this Provision, the Discharger shall install and maintain a permanent marker with calibration that indicates the water level at the design capacity and enables determination of available operational freeboard.
14. The unlined ponds shall be maintained to prevent leakage caused by erosion, slope failure, or animal burrowing.
15. Objectionable odors shall not be perceivable beyond the limits of the Panoche Energy Center property at an intensity that creates or threatens to create nuisance conditions.
16. As a means of discerning compliance with Provision 15, the dissolved oxygen (DO) content in the upper one foot of any wastewater pond shall not be less than 1.0 mg/L for

three consecutive weekly sampling events. If the DO in any single pond is below 1.0 mg/L for three consecutive sampling events, the Discharger shall report the findings to the California Energy Commission and the Central Valley Water Board in writing within 10 days and shall include a specific plan to resolve the low DO results within 30 days.

17. The Discharger must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the Discharger to achieve compliance with the conditions of these requirements. Proper operation and maintenance also include adequate laboratory controls and appropriate quality assurance procedures. This Provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by the Discharger only when the operation is necessary to achieve compliance with the conditions of these requirements.
18. By-pass (the intentional diversion of waste streams from any portion of a treatment facility, except diversions designed to meet variable effluent limits) is prohibited. The California Energy Commission may take enforcement action against the Discharger for by-pass unless:
 - a. By-pass was unavoidable to prevent loss of life, personal injury, or severe property damage. (Severe property damage means substantial physical damage to property, damage to the treatment facilities that causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a by-pass. Severe property damage does not mean economic loss caused by delays in production); and
 - b. There were no feasible alternatives to by-pass, such as the use of auxiliary treatment facilities or retention of untreated waste. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a by-pass that would otherwise occur during normal periods of equipment downtime or preventive maintenance; or (1) by-pass is required for essential maintenance to assure efficient operation; and (2) neither effluent nor receiving water limitations are exceeded; and (3) the Discharger notifies the Commission and Central Valley Water Board ten days in advance. The Discharger shall submit notice of an unanticipated by-pass in accordance with Provision 19 below.
19. In the event the Discharger does not comply or will be unable to comply with any prohibition or limitation of these requirements for any reason, the Discharger shall notify the Commission and Central Valley Water Board by telephone at ____-____-____ and (559) 445-5116, respectively, as soon as it or its agents have knowledge of such noncompliance or potential for noncompliance, and shall confirm this notification in writing within **two weeks**. The written notification shall state the nature, time and cause of noncompliance, and shall include a timetable for corrective actions.
20. The Discharger shall have a plan for preventing and controlling accidental discharges, and for minimizing the effect of such events. This plan shall:
 - a. Identify the possible sources of accidental loss or leakage of wastes from each waste management, treatment, or disposal facility.
 - b. Evaluate the effectiveness of present waste management/treatment units and operational procedures, and identify needed changes of contingency plans.

- c. Predict the effectiveness of the proposed changes in waste management/treatment facilities and procedures and provide an implementation schedule containing interim and final dates when changes will be implemented.
21. All reports shall be signed by persons identified below:
 - a. For a corporation: by a principal executive officer of at least the level of senior vice-president.
 - b. For a partnership or sole proprietorship: by a general partner or the proprietor.
 - c. A duly authorized representative of a person designated in 3a or 3b of this requirement if; (1) the authorization is made in writing by a person described in 3a or 3b of this provision; (2) the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a waste management unit, superintendent, or position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and (3) the written authorization is submitted to the Commission and Central Valley Water Board

Any person signing a document under this Section shall make the following certification:

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of the those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

22. All technical reports and work plans required herein that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared by or under the direction of persons registered to practice in California pursuant to California Business and Professions Code sections 6735, 7835, and 7835.1. As required by these laws, completed technical reports and work plans must bear the signature(s) and seal(s) of the registered professionals(s) in a manner such that all work can be clearly attributed to the professional responsible for the work. All reports required herein are required pursuant to Water Code section 13267.
23. The Department of Water Resources set standards for the construction and destruction of groundwater wells, as described in California Well Standard Bulletin 74-90 (June 1991) and Water Well Standards: State of California Bulletin 94-81 (December 1981). These standards, and any more stringent standards adopted by the State or county pursuant to Water Code section 13801, apply to all monitoring wells.
24. **At least 60 days prior to drilling monitoring wells described herein and in Provision 25,** the Discharger shall submit a Work Plan to the Commission for the installation of groundwater monitoring wells necessary to evaluate any changes in groundwater quality by the discharge of wastewater to land. All wells shall comply with appropriate standards as described in *California Well Standards Bulletin 74-90* (June 1991) and *Water Well Standards: State of California Bulletin 94-81* (December 1981), and any more stringent standards adopted by the Discharger or County pursuant to Water Code section 13801.

25. **At least 30 days prior to discharge**, the Discharger shall complete well installation and commence at least one round of groundwater monitoring in accordance with the Groundwater Monitoring section below.
26. **At least 30 days prior to discharge**, the Discharger shall submit a monitoring well installation report that describes all pertinent installation information and well construction features and includes the analytical results from the first round of groundwater monitoring.
27. **Within 120 days of the notification that construction will start as described in Provision 1**, the Discharger shall submit an operations and maintenance manual for energy center wastewater treatment and disposal facilities.

MONITORING

The Discharger shall maintain a written sampling program sufficient to assure compliance with the terms of these requirements. Anyone performing sampling on behalf of the Discharger shall be familiar with the sampling plan.

Field test instruments (such as pH) may be used provided that the operator is trained in the proper use of the instrument and each instrument is serviced and/or calibrated at the recommended frequency by the manufacturer and in accordance with manufacturer instructions. At minimum, all monitoring instruments and devices used by the Discharger to fulfill the prescribed monitoring requirements shall be properly maintained and calibrated at least yearly to ensure their continued accuracy.

Analytical procedures shall comply with the methods and holding times specified in the following: *Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater* (EPA); *Test Methods for Evaluating Solid Waste* (EPA); *Methods for Chemical Analysis of Water and Wastes* (EPA); *Methods for Determination of Inorganic Substances in Environmental Samples* (EPA); *Standard Methods for the Examination of Water and Wastewater* (APHA/AWWA/WEF); and *Soil, Plant and Water Reference Methods for the Western Region* (WREP 125). Approved editions shall be those that are approved for use by the United States Environmental Protection Agency or the California Department of Public Health's Environmental Laboratory Accreditation Program.

The Discharger shall retain records of all monitoring information, including all calibration and maintenance records, all original strip chart recordings of continuous monitoring instrumentation, copies of all reports required by these requirements, and records of all data used to complete the application for these requirements. Records shall be maintained for a minimum of three years from the date of the sample, measurement, report, or application. This period may be extended during the course of any unresolved litigation regarding this discharge or when requested by the California Energy Commission or Central Valley Water Board Executive Officer. Record of monitoring information shall include:

- a. the date, exact place, and time of sampling or measurements,
- b. the individual(s) who performed the sampling of the measurements,
- c. the date(s) analyses were performed,

- d. the individual(s) who performed the analyses,
- e. the laboratory which performed the analysis,
- f. the analytical techniques or methods used, and
- g. the results of such analyses.

Effluent Monitoring

When there is no wastewater discharge to the unlined evaporation/percolation ponds, the monitoring report shall state that during the required monitoring period(s), there was not flow to record or no sample collected. When there is wastewater flow, the Discharger shall sample wastewater at the point of discharge into the unlined evaporation/percolation ponds or where a representative sample may be obtained prior to disposal. Time of collection of the sample shall be recorded.

Effluent monitoring shall include the following:

<u>Frequency</u>	<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>
Continuous	Flow	mgd	Meter
Weekly	pH	pH units	Grab
Weekly	Electrical Conductivity (EC)	µmhos/cm	Grab
Monthly	Total Dissolved Solids (TDS)	mg/L	Grab
Monthly	TDS Load	lbs/month	Calculated
Monthly	Arsenic	mg/L	Grab
Monthly	Boron	mg/L	Grab
Monthly	Sodium	mg/L	Grab
Monthly	Sodium Adsorption Ratio	unitless	Calculated
Quarterly	General Minerals ¹	mg/L	Grab
Quarterly	Metals ^{1,2}	mg/L	Grab

¹ With the exception of wastewater samples, samples must be filtered. If field filtering is not feasible, samples shall be collected in unpreserved containers and submitted to the laboratory within 24 hours with a request (on the chain-of-custody form) to immediately filter then preserve the sample.

² Metals reference hereafter in this program include: Aluminum, Antimony, Arsenic, Barium, Copper, Cadmium, Chromium, Iron, Lead, Manganese, Mercury, Molybdenum, Nickel, Selenium, Silver, Thallium, and Zinc.

Injection Well Monitoring

<u>Frequency</u>	<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>
Continuous	Flow	mgd	Meter
Quarterly	TDS	mg/L	Grab
Quarterly	TDS Load	lbs/month	Calculated

* Pond Monitoring

Permanent markers (e.g., staff gages) shall be placed in all evaporation/percolation ponds. The markers shall have calibrations indicating water level at the design capacity and available operational freeboard. Evaporation/percolation pond monitoring shall include at least the following:

<u>Frequency</u>	<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>
Weekly	Freeboard	Feet ¹	Observation
Weekly	Odors	---	Observation
Weekly	Berm Condition	---	Observation

¹ To nearest tenth of a foot

The Discharger shall inspect the condition of the evaporation/percolation ponds weekly and record visual observations in a bound logbook. Notations shall include observations of whether weeds are developing in the water or along the bank, and their location; whether grease, dead algae, vegetation, scum, or debris are accumulating on the evaporation/percolation pond surface and their location; whether burrowing animals or insects are present; and the color of the reservoirs (e.g., dark sparkling green, dull green, yellow, gray, tan, brown, etc.). A summary of the entries made in the log shall be included in the subsequent monitoring report.

Groundwater Monitoring

After measuring water levels and prior to collecting samples, each monitoring well shall be adequately purged to remove water that has been standing within the well screen and casing that may not be chemically representative of formation water. Depending on the hydraulic conductivity of the geologic setting, the volume removed during purging is typically from 3 to 5 volumes of standing water within the well casing and screen, or additionally the filter pack pore volume. Samples shall be collected and analyzed for the following:

<u>Frequency</u>	<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>
Quarterly	Depth to groundwater	Feet ¹	Measured
Quarterly	Groundwater elevation	Feet ²	Calculated
Quarterly	pH	pH units	Grab
Quarterly	EC	umhos/cm	Grab
Quarterly	TDS	mg/L	Grab
Quarterly	Arsenic ³	mg/L	Grab
Quarterly	Boron ³	mg/L	Grab
Quarterly	Sodium ³	mg/L	Grab
Quarterly	General Minerals ³	mg/L	Grab
Quarterly	Metals ^{3,4}	mg/L	Grab

¹ To nearest tenth of a foot

² To nearest tenth of a foot above mean Sea Level

- ³ With the exception of wastewater samples, samples must be filtered. If field filtering is not feasible, samples shall be collected in unpreserved containers and submitted to the laboratory within 24 hours with a request (on the chain-of-custody form) to immediately filter then preserve the sample.
- ⁴ Metals reference hereafter in this program include: Aluminum, Antimony, Arsenic, Barium, Copper, Cadmium, Chromium, Iron, Lead, Manganese, Mercury, Molybdenum, Nickel, Selenium, Silver, Thallium, and Zinc.

Source Water Monitoring

For each source (either well or surface water supply), the Discharger shall calculate the flow-weighted average concentrations for the specified constituents utilizing monthly flow data and the most recent chemical analysis conducted in accordance with the following requirements. Alternatively, the Discharger may establish representative sampling stations within the facility's distribution system .

<u>Frequency</u>	<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>
Quarterly	pH	pH units	Grab
Quarterly	EC	umhos/cm	Grab
Quarterly	TDS	mg/L	Grab
Quarterly	Arsenic	mg/L	Grab
Quarterly	Boron	mg/L	Grab
Quarterly	Sodium	mg/L	Grab
Quarterly	General Minerals ¹	mg/L	Grab
Quarterly	Metals ^{1,2}	mg/L	Grab

¹ With the exception of wastewater samples, samples must be filtered. If field filtering is not feasible, samples shall be collected in unpreserved containers and submitted to the laboratory within 24 hours with a request (on the chain-of-custody form) to immediately filter then preserve the sample.

² Metals reference hereafter in this program include: Aluminum, Antimony, Arsenic, Barium, Copper, Cadmium, Chromium, Iron, Lead, Manganese, Mercury, Molybdenum, Nickel, Selenium, Silver, Thallium, and Zinc.

Reporting

All monitoring results shall be reported in **Quarterly Monitoring Reports** which are due by the first day of the second month after the calendar quarter. Copies shall be mailed to:

California Energy Commission
1516 9th Street
Sacramento, CA 95814

and

Central Valley Regional Water Quality Control Board
1685 E Street
Fresno, CA 93726

A transmittal letter shall accompany each monitoring report. The transmittal letter shall discuss any violations that occurred during the reporting period and all actions taken or planned for correcting violations, such as operation or facility modifications. If the Discharger has previously submitted a report describing corrective actions or a time schedule for implementing the corrective actions, reference to the previous correspondence is satisfactory.

The following information is to be included on all monitoring and annual reports, as well as report transmittal letters:

Discharger Name
Facility Name
Contact Information (telephone number and email)

In reporting monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner that illustrates clearly, whether the Discharger complies with waste discharge requirements.

Monitoring information shall include the method detection limit (MDL) and the reporting limit (RL) or practical quantitation limit (PQL). If the regulatory limit for a given constituent is less than the RL (or PQL), then any analytical results for that constituent that are below the RL (or PQL) but above the MDL shall be reported and flagged as estimated.

Laboratory analysis reports do not need to be included in the monitoring reports; however, the laboratory reports must be retained for a minimum of three years.

All monitoring reports shall comply with the signatory requirements in Provision 21.

All monitoring reports that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared by or under the direction of persons registered to practice in California pursuant to California Business and Professions Code sections 6735, 7835, and 7835.1.

Fourth Quarter Monitoring Reports, in addition to the above, shall include the following:

Panoche Energy Center Information

1. The names and general responsibilities of all persons in charge of wastewater treatment and disposal.
2. The names and telephone numbers of persons to contact regarding the Panoche Energy Center for emergency and routine situations.
3. A statement certifying when the flow meter and other monitoring instruments and devices were last calibrated, including identification of who performed the calibrations.
4. A statement whether the current operation and maintenance manual, sampling plan, and contingency plan, reflect the Panoche Energy Center as currently constructed and operated, and the dates when these documents were last reviewed for adequacy.

5. A summary and discussion of the compliance record for the reporting period. If violations have occurred, the report shall also discuss the corrective actions taken and planned to bring the discharge into full compliance with these requirements.

The Discharger shall implement the above monitoring program on the first day of the month following adoption of these requirements.

GLOSSARY

BOD ₅	Five-day biochemical oxygen demand
CBOD	Carbonaceous BOD
DO	Dissolved oxygen
EC	Electrical conductivity at 25° C
FDS	Fixed dissolved solids
NTU	Nephelometric turbidity unit
TKN	Total Kjeldahl nitrogen
TDS	Total dissolved solids
TSS	Total suspended solids
Continuous	The specified parameter shall be measured by a meter continuously.
24-Hour Composite	Samples shall be a flow-proportioned composite consisting of at least eight aliquots.
Daily	Samples shall be collected at least every day.
Twice Weekly	Samples shall be collected at least twice per week on non-consecutive days.
Weekly	Samples shall be collected at least once per week.
Twice Monthly	Samples shall be collected at least twice per month during non-consecutive weeks.
Monthly	Samples shall be collected at least once per month.
Bimonthly	Samples shall be collected at least once every two months (i.e., six times per year) during non-consecutive months.
Quarterly	Samples shall be collected at least once per calendar quarter. Unless otherwise specified or approved, samples shall be collected in January, April, July, and October.
Semiannually	Samples shall be collected at least once every six months (i.e., two times per year). Unless otherwise specified or approved, samples shall be collected in April and October.
Annually	Samples shall be collected at least once per year. Unless otherwise specified or approved, samples shall be collected in October.
mg/L	Milligrams per liter
mL/L	milliliters [of solids] per liter
µg/L	Micrograms per liter
µmhos/cm	Micromhos per centimeter
mgd	Million gallons per day
MPN/100 mL	Most probable number [of organisms] per 100 milliliters
General Minerals	Analysis for General Minerals shall include at least the following:
	Alkalinity
	Chloride
	Sodium
	Bicarbonate
	Hardness
	Sulfate
	Calcium
	Magnesium
	TDS
	Carbonate
	Potassium
	Nitrate

General Minerals analyses shall be accompanied by documentation of cation/anion balance.